Moisture Analyzer

Europen Catalogue Numbers:

ECN	DESCRIZIONE
611-4489	MOISTURE ANALYZER 60g/0.1mg, GRAPHIC DISPLAY
611-4490	MOISTURE ANALYZER 160g/1mg, GRAPHIC DISPLAY
611-4500	MOISTURE ANALYZER 60g/10mg, GRAPHIC DISPLAY
611-4517	MOISTURE ANALYZER 60g/0.1mg, GRAPHIC DISPLAY + CERT.
611-4518	MOISTURE ANALYZER 160g/1mg, GRAPHIC DISPLAY + CERT.
611-4519	MOISTURE ANALYZER 60g/10mg, GRAPHIC DISPLAY + CERT.

User manual

Software Revision Th_3.xx

Legal Address of Manufacturer

Europe
VWR International bvba
Researchpark Haasrode 2020
Geldenaaksebaan 464
B-3001 Leuven
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http://be.vwr.com

Country of origin

Italy

Intended use

Moisture balances can be used for quality check in laboratory, food and beverages industry, material industry,etc…

TABLE OF CONTENTS

1 Safety instructions and warnings

WARNING:
Please read these installation and operating instructions carefully before starting your work with the new scale. Any use of the device other than that specified in this manual no longer guarantees the safety of the product. Keep the instruction manual carefully.

Intended use

The iThermo moisture analyzer is used for the fast and precise analysis of liquid, pasty and solid material moisture based on the thermogravimetric method.

Observe the following instructions for safe and trouble-free operation of the moisture analyzer:

- Use the moisture analyzer exclusively for the determination of sample moisture. Any improper use of the appliance may endanger the safety of persons and cause damage to the device or other objects.
- Do not use the device in areas where there is a risk of explosion; also operate the device only in compliance with the environmental conditions listed in this instruction manual.
- Do not use the device for chemically hazardous substances, toxic substances that can cause biohazard, explosive flammables or substances that release aggressive vapors when heated.
- If electrical equipment is used in systems and in environmental conditions that require greater safety measures, comply with the provisions of the directives for the installation of this material in force in your country.
- The device must only be used by qualified personnel who know the properties/characteristics of the sample used.
- Before operating the device for the first time, check whether the supply voltage corresponds to the mains voltage.
- To disconnect the device from the mains voltage, disconnect the power cord.
- Lay the power cable in such a way as to avoid contact with very hot surfaces of the device.
- Use only extension cables that comply with the regulations and have a protective conductor with a minimum operating temperature of at least 70°C.

Warning: protection against heat

- Observe the following distance and the free space around the device to avoid heat accumulation in the device and overheating of the device:
  - 20 cm around the device
  - 1 m above the device
- Do not place flammable materials on, under or near the device as the heating element overheats the surrounding area.
- Remove the samples carefully, as the heating element and the sample-holder plates may still be very hot. To avoid burns with parts of the high-temperature oven, use thermally insulated gloves or pliers.

2 Installation

Gently remove the device from the packaging, check that the device has no visible damage caused by transport and that there are all the accessories listed below.

2.1 Package Contents

1 Moisture determination tool.
2 VDE power cable
3 15-pole M/F cable for connection of the scale/heater
4 Underplate
5 Sample-holder plate extractor
6 Tray with antiventilation cylinder
7 #10 sample plates
8 CD with instruction manual

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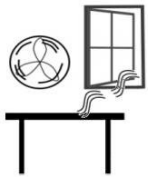
2.2 Positioning of the device

The device was manufactured in such a way that reliable weighing results are obtained under normal operating conditions. The choice of the correct placement of the device is therefore important to ensure optimal and precise operation.

To choose the place where to install the device, the following criteria must be met:

Do not install the scale in environments where there are drafts, strong temperature changes.



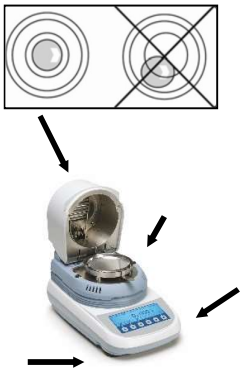
Avoid exposure to extreme temperatures, as well as temperature changes that occur, for example, if the device is placed in radiators or in places exposed to sunlight.

Do not place the device near explosive and flammable materials.

Place the device on a stable and level surface.
Avoid shaking during weighing.

The humidity of the environment of use of the scale must be between 40% and 70%.
Do not expose the device to prolonged intense humidity. Unwanted condensation on the device can occur when it is cold and is placed in a room with a higher temperature. In this case the device must be disconnected from the mains and acclimated to the ambient temperature for about two hours.

Level the device by adjusting the special feet 2 on the front and one on the back of the device. The level bubble is located at the rear of the heater.



Adjustable feet

2.3 Start-up

All the operations to be performed to prepare the device for the first start-up are described below.

Open the oven lid and place:

1. Tray with antiventilation cylinder
2. Place the flat sample holder tray extractor
3. Place the star-shaped item on the weighing cone.

The scale is connected to the heater via a 15-pole M/F cable.
Insert the cable into the two connectors on the back of the device as shown in the figure.

Insert the VDE cable supplied into the power connector on the back of the device.

N.B. Check that the power supply shown on the label of the device corresponds to the one in use in the Country where you are installing the device.

Then connect the VDE cable to the socket located near the device. Do not use cables/extensions that do not comply with current regulations.

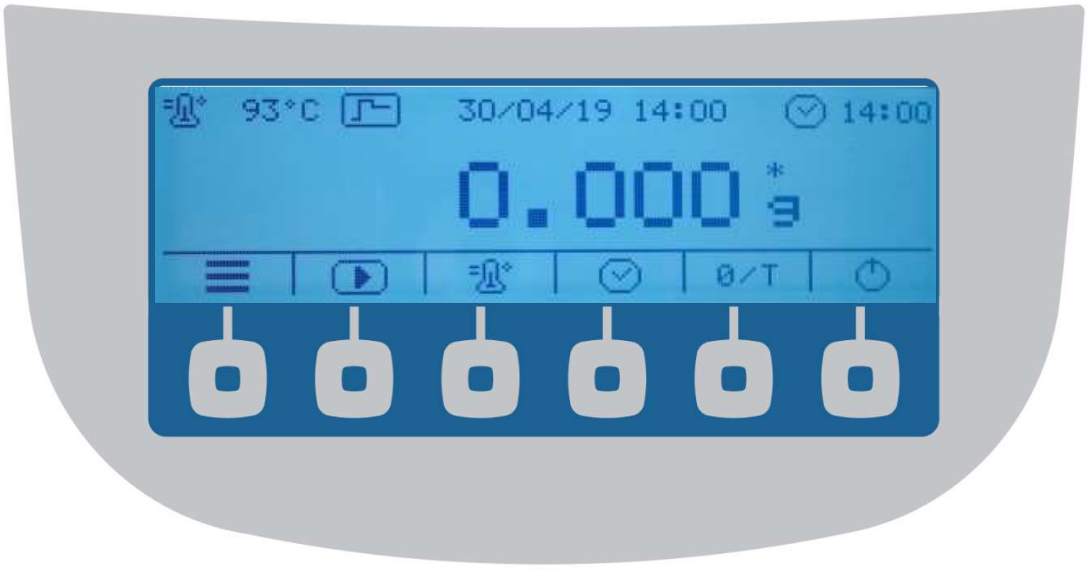
Wait 30 minutes after switching on and calibrate the device after leveling it.
Perform device calibration whenever it is moved to another location.

It is recommended not to drop objects of excessive weight on the weighing plate of the scale to avoid damaging it.

The assistance service must be performed by specialized personnel and the spare parts used must be original. To do this, contact the retailer where the device was purchased.

3 Keyboard and display

The device is equipped with a backlit graphic display and a keyboard with six function keys.



The function of the keys varies according to the operations to be performed, and is indicated in the part above the key in the lower area of the display.

Key bar available on simple weighing screens.

Reset/tare operation activation key.

Device standby mode key.

Drying mode setting key.

Drying temperature setting key.

Start cycle analysis key.

Simple Key Press to access the main menu.

Long press of the key (2 sec.) to access the scale setup menu

Available key bar during the drying cycle.

Key to cancel the drying cycle in progress.

Key for interrupting the drying cycle. Touching this key stops the drying cycle.

Key for displaying the parameters set for drying.

Key for selecting the parameter to be displayed, in rotation:

- **% M** Moisture
- **% R** Dry residue
- **% A** Other (Ratio between initial weight and final weight expressed in %)
- **g** Weight

Key bar available at the end of the drying cycle.

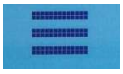
Exit key from the drying function

Key for activating/deactivating and modifying GLP parameters.

Key for selecting the end-of-drying parameter to be displayed, in rotation:

- **% M** Moisture
- **% R** Dry residue
- **% A** Atro (Ratio between initial weight and final weight expressed in %)
- **g** Weight

Key to print the result.



Parameter display key used for the drying cycle.

4 Standby off function

After inserting the power cable into the mains socket, the device will turn on automatically and after performing the system test it will be positioned on the standby screen.

Press the key corresponding to the power symbol  to start the device.

The device will be initialized and will display the weighing screen.

To return to the standby status, press the key  again

Shutdown

To completely switch off the device, remove the plug from the mains socket.

5 Simple weighting and settings for first use

After connecting the power supply, the software version and the model of the device will appear on the display.
The device will now be in the standby state, so press the key to switch on the device and then display the weighing screen.

In the weighing screen, the value of the weight loaded on the weighing plate is displayed in the central area.

Press the key 

to set a new zero point and reset all the tare values.

Place the material to be weighed on the scale and wait for the stability symbol to light up before detecting the value.

Also, during use in simple weighing mode, on the display in the upper part besides the date and time, the information relating to the settings of the drying cycle is displayed:

-  **xxx °C:** in the weight display, it indicates the value of the temperature set for the drying cycle, while, during the drying cycle, it indicates the current temperature of the heater.

N: B: below the 35°C temperature value is not displayed.

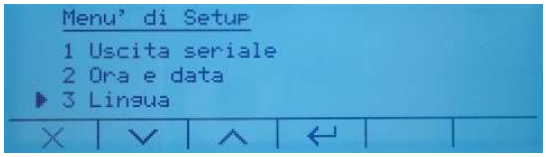
-  **o**  **:** Indication of the oven heating mode, respectively: fast or standard.
-  **:** Indication of the analysis determination method: automatic or timed.
-  **:** Key for starting the drying cycle.

5.1 Language selection

The tool can be set to display information in 6 different languages.

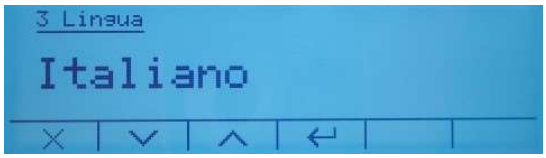
- Italian
- German
- French
- Spanish
- Portuguese
- English

Press and hold the menu key for 2 seconds.



Use the arrow keys to move up and down in the menu and go to section **3 - Language**.

Confirm the selection with the key .



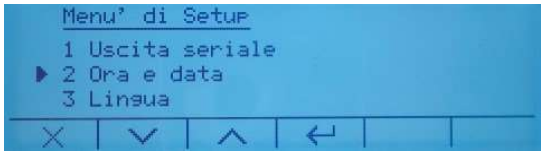
Then select the desired language using the keys to move up and down.

Confirm the selection with the key .

Press the key to exit without changing the language.

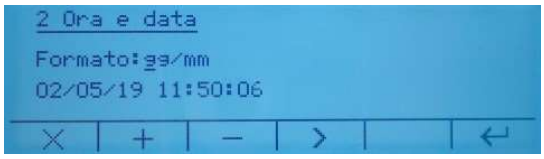
5.2 Setting Date-Time

Press and hold the menu key for 2 seconds.



Use the arrow keys to move up and down in the menu and go to section **2 - Time and Date**.

Confirm the selection with the key .



Select the desired date format, **dd/mm** or **mm/dd**, using the "+ and -" keys.

Press the key to move on to adjust the next parameter and always use the "+ and -" keys to change the value.

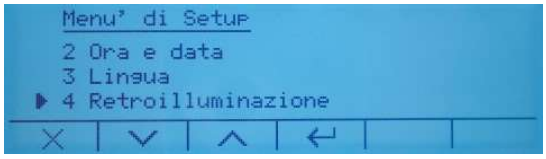
Once the new values have been set, confirm with the key .

Press the key to exit without changing the value.

5.3 Preferences: backlight and contrast.

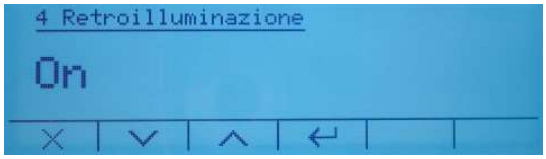
You can set, according to your needs, the contrast and the backlight of the device display.

Press and hold the menu key for 2 seconds.



Use the arrow keys to move up and down in the menu and go to section **4 - Backlight**.

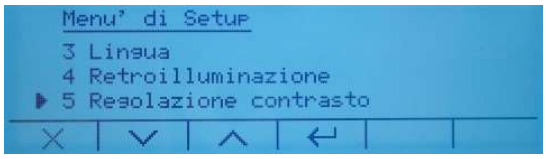
Confirm the selection with the key .



Select the mode with backlighting enabled "On" or disabled "Off" using the up and down arrows.

Confirm the selection with the key .

Press the key to exit without changing the setting.



Use the arrow keys to move up and down in the menu and go to section **5 - Contrast Adjustment**.

Confirm the selection with the key .

Select the desired contrast level using the "+ and -" keys.
The range of contrast adjustment is from 0 to 15.

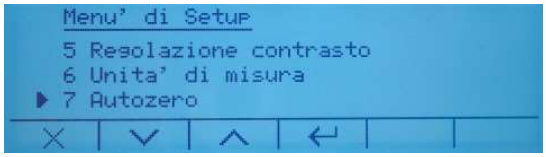
Confirm the selection with the key .

Press the key to exit without changing the value.

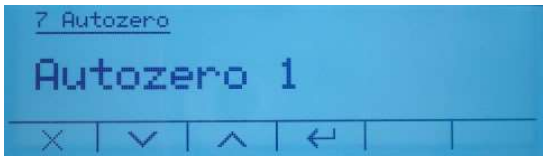
5.4 Setting the weighing parameters

For a correct use of the scale, you can set the right settings of the weighing parameters according to the environment of use.
This section describes the parameters of autozero, filter, stability and unit of measurement of the weighing.

Press and hold the menu key for 2 seconds



Use the arrow keys to move up and down in the menu and go to section **7 - Autozero.**

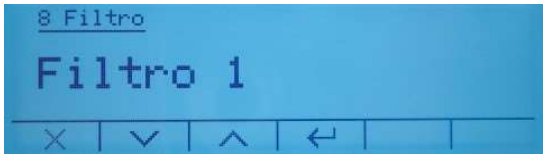


- **Autozero:** automatic zero correction constantly adjusts the value of zero. These possible variations can be due for example to the dirt that can be deposited on the plate. You can deactivate this function by selecting the "Off" mode. Level 1 is the one with the lowest correction until you reach level 3E that is the maximum correction.

Select the desired level and confirm with the key .

Press the key to exit without changing the value.

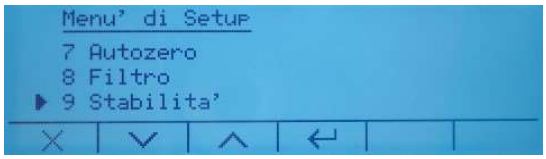
Use the arrow keys to move up and down in the menu and go to section **8 - Filter**.

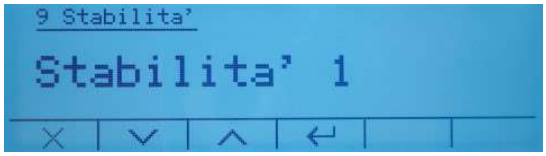


- **Filter2:** the filter function makes it possible to speed up or slow down the response of the scale according to the weighing requirements and environmental conditions. Selecting level 1, the response will be immediate but the scale will remain more sensitive to environmental disturbances such as ventilation and vibrations. Increasing the level, the response will be slower and the indication more stable

  - **Level 1:** dosage conditions
  - **Level 2:** stable conditions
  - **Level 3:** unstable conditions

Select the desired level and confirm with the key .





Use the arrow keys  to move up and down in the menu and go to section **9 - Stability**.

- **Stability:** this function allows you to adapt the scale to the environmental working conditions. When using the device in a virtually vibration-free environment, select level 0. The default level is 2. Use level 3 for very noisy environments.

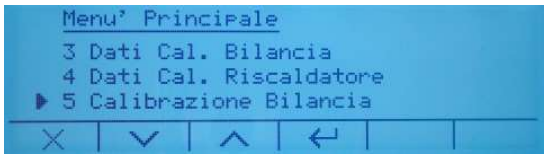
  - **Level 1:** For poorly stable environments.
  - **Level 2:** For unstable environments.
  - **Level 3:** For highly unstable environments.

Select the desired level and confirm with the key  .

5.5 Calibration and calibration mode setting

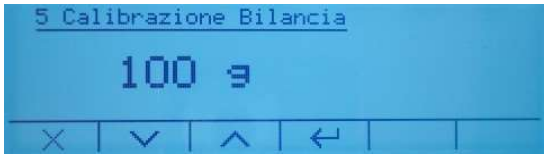
The electronic scale makes mass measurements using gravity (g). Different geographical regions and differences in altitude correspond to different values of gravity acceleration (g). Therefore, to obtain accurate measurements, the scale must be adapted to the place of use and to the environmental conditions. This adjustment is made via the calibration function.

Press the menu key to access the main menu.



Use the arrow keys to move up and down in the menu and go to section **5 – Calibration of the scale.**

Then confirm the selection with the key .



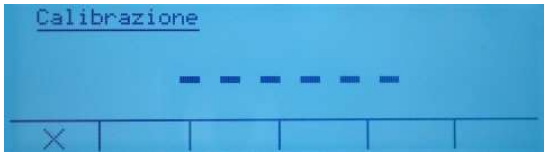
Before performing the calibration procedure, check that the plate is empty.

You can calibrate the scale using the default weight. Or through automatic weight recognition.

Use the arrows to switch from one mode to another.

Then confirm the selection with the key .

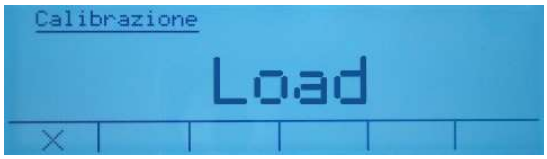
Default weight method:
By selecting the default calibration mode when the calibration command is given, the required weight will be the factory default one whose value will vary according to the scale model.
After confirming, the calibration procedure will be activated.



Load the required calibration weight or press the key to cancel the calibration procedure.

Wait for the weight to be acquired.

If the operation is successful, the weighing screen will be displayed with the value of the calibrated weight.
Then remove the weight from the plate.



External choice
By selecting the "external choice" calibration mode, you can calibrate the scale with a different weight than the default one.

After confirming, the calibration procedure will be activated.

Load on the plate a weight equal to or greater than the default calibration weight, so the scale will recognize as valid a weight equal to or greater than the calibration weight as long as it is a full value weight with respect to the most significant figure of the default calibration weight.

Example: if the calibration weight is 20g, you can calibrate the scale with values ranging from 20g, 40g, 60g up to the upper limit of scale capacity.

Load the weight or press the key  to cancel the calibration procedure.

Wait for the weight to be acquired.

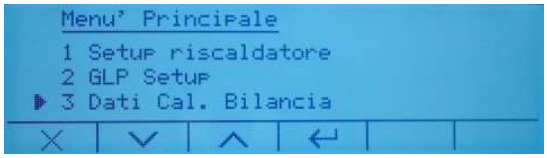
If the operation is successful, the weighing screen will be displayed with the value of the calibrated weight.

Remove the weight from the plate.

5.6 Display and print of the scale calibration data.

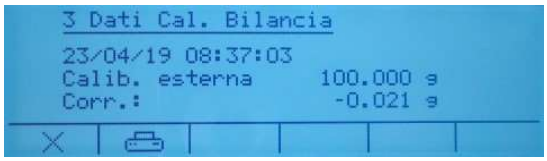
This section describes how to view and print the calibration data.

Press the menu key  to access the main menu.



Use the keys to move up and down in the menu and go to section
3 – Scale Cal. Data.

Then confirm the selection with the key  .



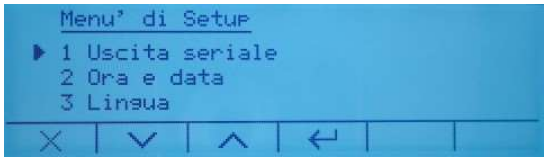
Calibration Data: in the calibration data screen, you can check the date on which the last calibration was performed, the mode in which it was performed, the value of the weight used and the correction made with respect to the previous calibration. Press the key  to print the displayed data.

Press the key  to exit.

5.7 Device Settings

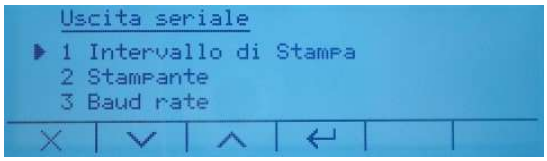
This section describes the functionalities and the relative settings of the RS232 serial output with which the device is equipped.

Press and hold the menu key  for 2 seconds.



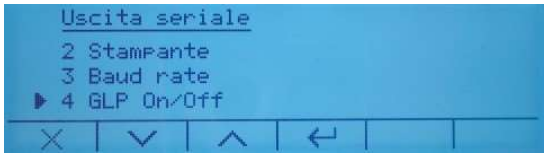
Use the arrow keys  to move up and down in the menu and go to section **1 – Serial output.**

Then confirm the selection with the key  .



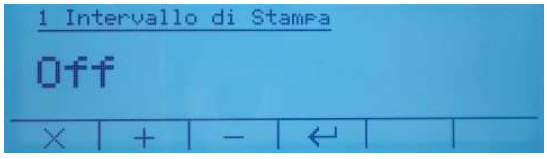
You access to the following menu:

1 - Print Interval
2 - Printer
3 - Baud rate
4 - GLP On/Off

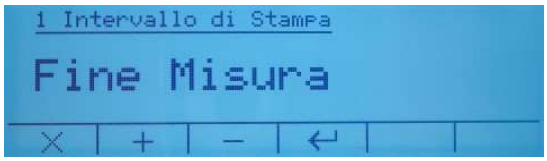


Use the arrows  to switch from one setting to another.

Then confirm the selection with the key  .

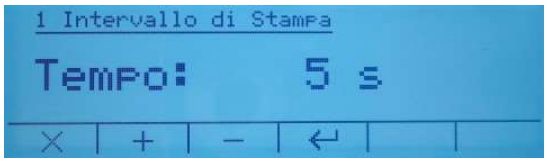


1 – Print Interval: this function allows you to define the print interval.

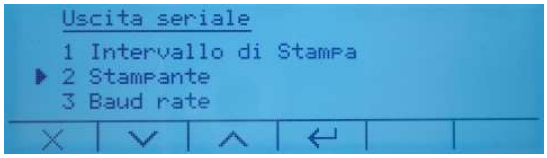


- **Off,** print interval disabled.

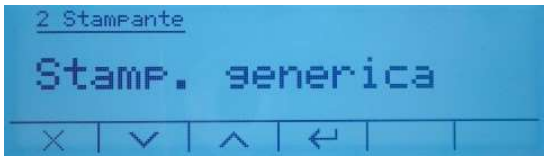
- **End Measure,** automatic printing of test results at the end of the analysis.



- **In Time,** print the analysis data during the test at a set interval. (The settable time interval ranges from 5sec. to 250sec. with 1sec. steps).

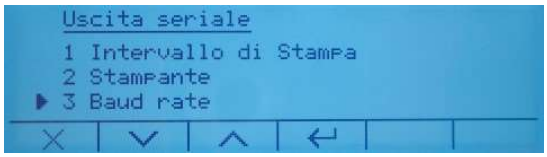


2 – Printer: this function allows you to select the device connected to the serial output.



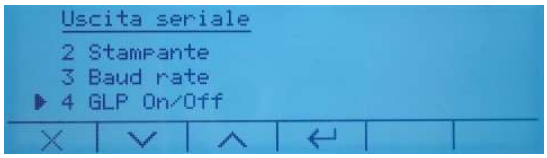
- **Generic print:** print on command, by pressing the key 
  For general purpose serial print.

- **Tlp50:** command printing, pressing the key  for Tlp50 printer model

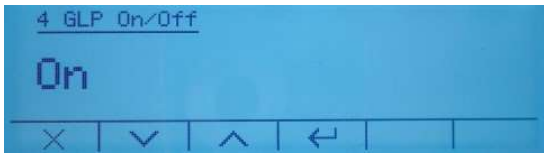


3 – Baud rate: parameter for selecting the transmission speed of the serial port.
The selectable speeds are the following:

- **1200 Baud**.
- **2400 Baud**.
- **4800 Baud**.
- **9600 Baud**.



1 – GLP On/Off: function that allows you to activate or deactivate the printing of g.l.p. data prior entry by the user.



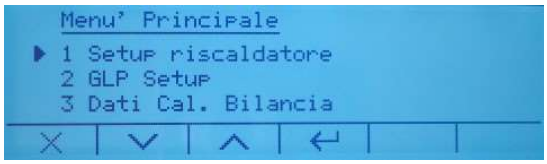
- **On** : print of g.l.p. data enabled.
- **On** : print of g.l.p. data disabled.

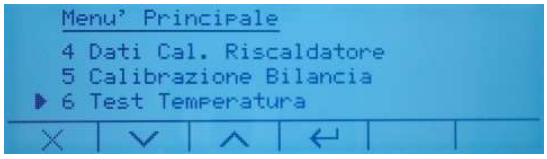
For information entry and g.l.p. database management, see the **next chapter.**

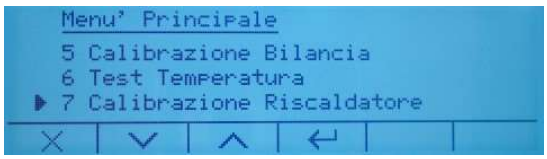
6 Main menu

This section describes all the functions available for the analysis of the moisture content of the substances and the parameter settings relating to the operating mode of the heater.

Press the menu button  .





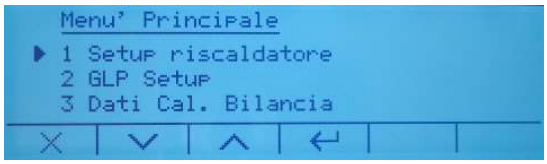


From the main menu, you can act on the parameters:

1 - Heater setup
2 - GLP Setup
3 - Scale calibration data
4 - Heater calibration data
5 - Scale calibration
6 - Temperature Test
7 - Heater calibration

Use the arrow keys  to switch from one setting to another.

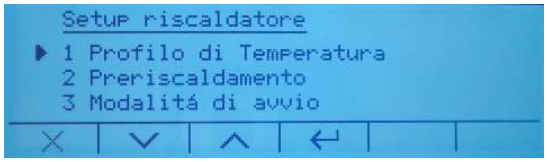
Then confirm the selection with the key  .



6.1 1 - Heater setup

this function allows you to set the following parameters:

- **Temperature profile.**
- **Warm up.**
- **Startup mode.**
- **Delayed start.**
- **Stability test.**



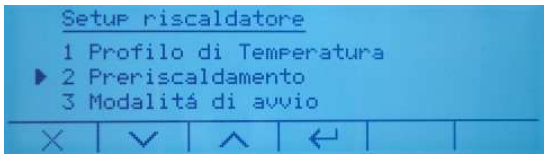
1 - Temperature profile allows you to set the heating mode for the drying cycle. Select the heating mode and temperature according to the substance to be analyzed.

For all heating modes, **the temperature values that can be set range from a minimum of 35°C to a maximum of 160°C.**

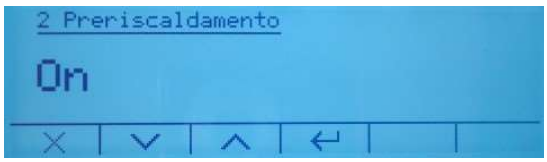
- **Standard** this mode is pre-set at the factory and is suitable for most samples. In this case, after start-up the temperature is increased with a factory-set speed until the set value is reached and then kept fixed until the end of the measurement

- **Rapid** this method is suitable for samples with a moisture content greater than 30%. After starting, the temperature will exceed the set value by about 30% for 2 minutes and then settle at the set value. This is to speed up the drying process.

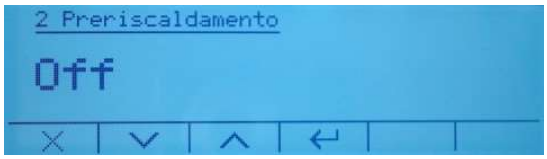
Then confirm the selection with the key  .



2 – Warm up: this function allows you to preheat the heater before performing a drying cycle.



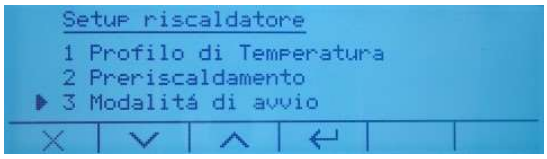
- **On,** preheating function enabled.
- **Off,** preheating function disabled.

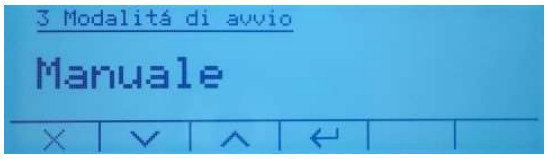


With the function enabled before executing the drying cycle, the preheating screen will be displayed. Press  to cancel the preheating and start immediately with the drying cycle.

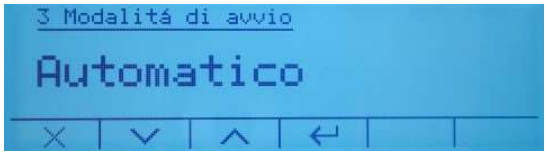
N.B. the active preheating function allows you to obtain more repeatable results as each cycle takes place with the same starting condition of the heater.

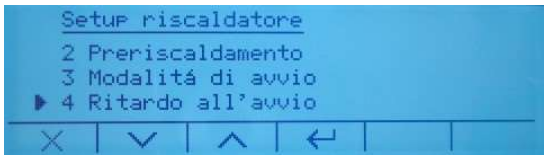
3 – Startup mode: this function allows you to choose the mode for starting the drying program.2



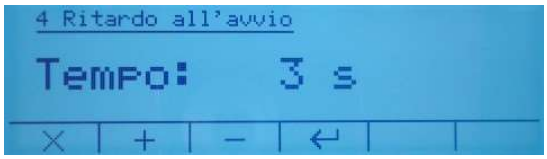


- **Manual,** with this mode every preparation operation for the start of the drying cycle must be confirmed by the user that after switching off the heater must press the confirmation key.
- **Automatic,** with this mode every preparation operation for the start of the drying cycle will be performed automatically when the heater is switched off.



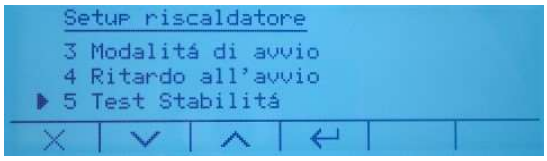


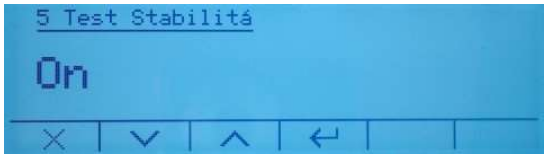
4 - Delayed start: The start of the drying cycle can be delayed with a time interval between 0 and 15 seconds.



Use the keys + | − to increase and decrease the time.

Then confirm the selection with the key ↵ .



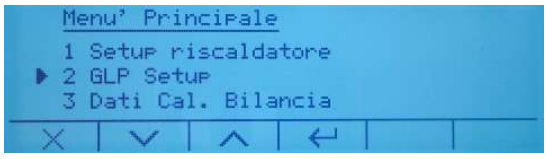


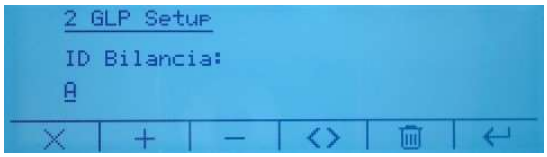
5 - Stability test: This function allows you to activate "On" or disable "Off" the stability test of the weigh before the drying cycle starts.

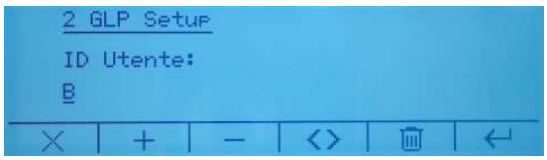
- **On,** stability test enabled.
- **Off,** stability test disabled.

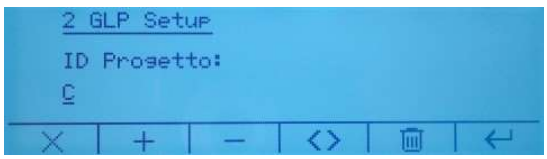
6.2 GLP Setup

This function allows you to enter and customize the g.l.p. parameters.





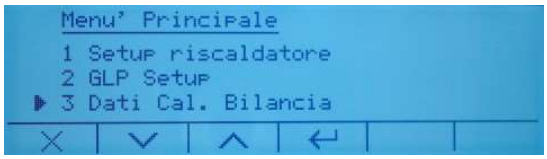


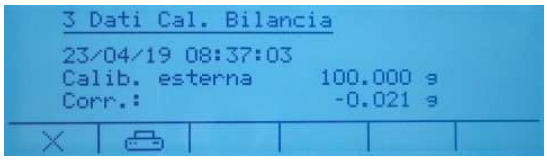


- **Scale ID**
- **Project ID**
- **User ID**

Enter the desired data using the keys + | − to scroll through the available characters and the key <> to move the cursor. Pressing the key 🗑 once allows eliminating the character underlined by the cursor; a long press completely eliminates the word entered.

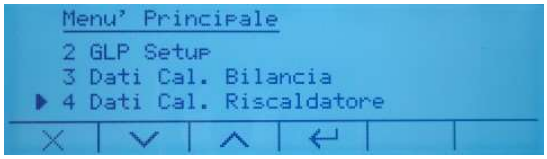
Confirm the text entered with the key ↵ .





Scale calibration data
This function allows you to view and print the data related to the last calibration of the scale.

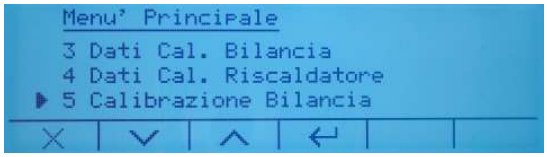
- Calibration execution date.
- Calibration mode.
- Value of the correction made.



6.3 Heater Calibration Data

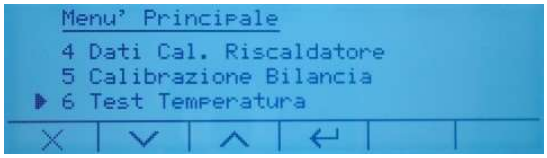
By selecting this function, you can display and print the thermometer calibration data.

- Calibration execution date.
- Temperature used for the 1st section.
- Temperature used for the 2nd section.



6.4 Scale calibration

This function allows the scale to be calibrated, for more information refer to chapter 5.5



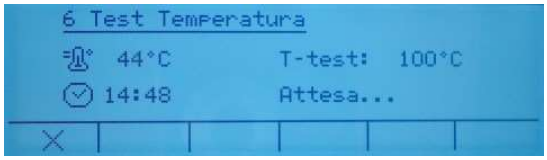
6.5 Temperature test

This function allows you to enter a temperature value for which you want to carry out a verification test of correctness.

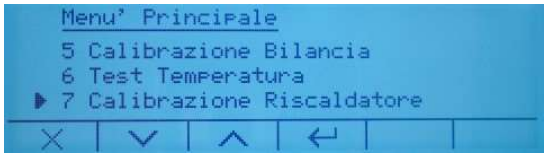
N.B. To perform the test, the STCi-02 accessory must be placed. Refer to the instructions supplied with the accessory for correct use.

Use the keys + | − to increase and decrease the temperature.

Then confirm the selection with the key ↵.



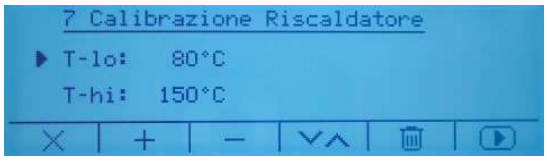
The test will then start, so press the key ✕ to stop the test.



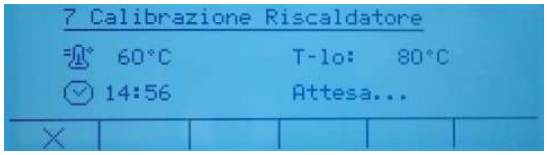
6.6 Heater calibration

This function allows the thermometer calibration of the heater to be performed.

N.B. The calibration must be performed by specialized personnel.
To perform the test, the STCi-02 accessory must be placed. Refer to the instructions supplied with the accessory for correct use.



Use the keys + | − to increase and decrease the temperature and the keys ⌄⌃ to switch from T-lo to T-hi.



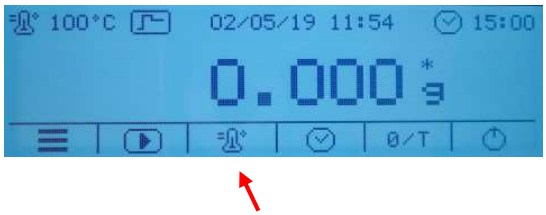
Confirm and proceed with the calibration by pressing the key ▶.

To cancel the calibration operation, press the key ✕.

7 Moisture determination.

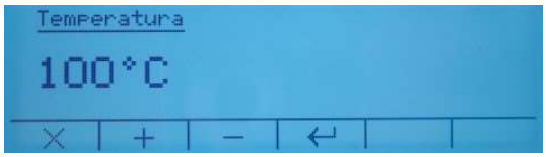
This section describes how to set the drying parameters to be able to perform the analysis of the moisture content.

- **Temperature**
- **End of drying mode**



7.1 Temperature setting

From the weighing screen, press the key  to set the desired drying temperature.

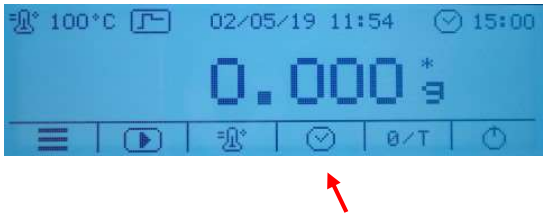


The default temperature is 100°C, so use the keys  to increase or decrease the value. Keeping the key pressed for a long time, the value is increased or decreased rapidly.

Confirm the value set with the key 

To cancel the operation and exit, press the key  .

N.B. the temperature that can be set ranges from a minimum of 35°C to a maximum of 160°C.



7.2 Setting the drying end method

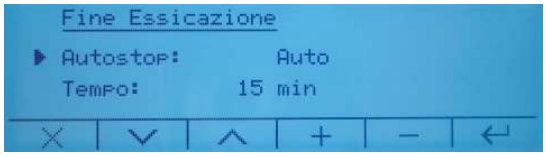
From the weighing screen, press the key  to set the end of drying mode

The end drying parameter is the setting that defines the method by which the end of the humidity measurement cycle contained in the substance to be analyzed is to be determined.

Two methods are available for determining the end of the drying cycle:

Use the arrows  to switch from one mode to another.

Then confirm the selection with the key  .



- **Autostop:** setting this end-of-drying method, the cycle will end when the change in the weight loss of the substance will be less than the value set for the indicated time interval. You can end the cycle manually at any time by pressing the key  .

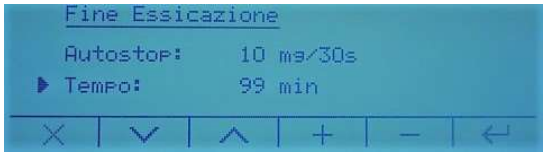
Use the keys  to change the Autostop method parameters.

The available options are as follows:

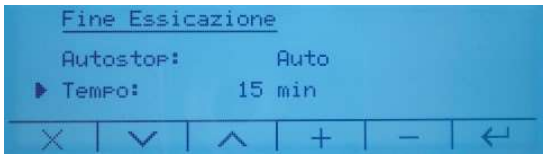
- **Auto** automatic program with parameters defined by the manufacturer, suitable for most of the substances to be analyzed.
- **1 mg/30sec up to 10mg/30sec**; you can choose the weight loss threshold below which the drying cycle is interrupted. The selectable values range from 1mg to 10mg every 30 seconds.

Confirm the value set with the key 

To cancel the operation and exit, press the key  .



- **Time:** setting this end-of-drying method, the cycle will end when the set time has elapsed. You can manually stop the cycle at any time during the test by pressing the key  .

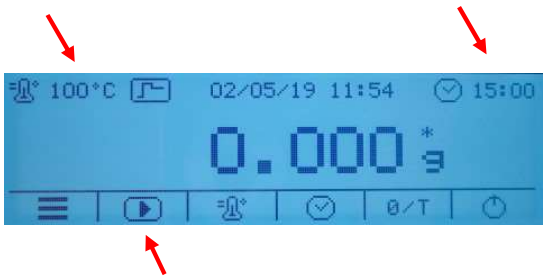


The default cycle time is 15min, so use the keys + | − to increase or decrease the value. Keeping the key pressed for a long time, the value is increased or decreased rapidly.

N.B. the settable duration ranges from a minimum of 1 minute to a maximum of 99 minutes.

Confirm the value set with the key ↵

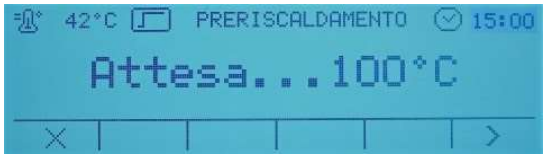
To cancel the operation and exit, press the key ✕ .



7.3 Start of the analysis.

After defining the temperature and the drying end method, the device is ready to start the analysis cycle.

Just press the key ▶ and follow the instructions on the display.



If the preheating function is enabled, you will be asked to switch off the heater if it is ON.
Switch off the heater and wait.

Press the key > to skip the preheating phase

When the preheating phase ends, the readiness screen is displayed to start the analysis.

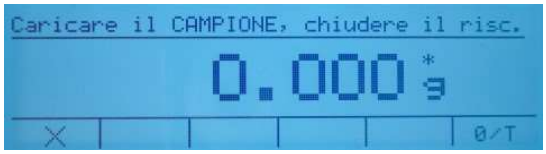
Press the key > to continue or the key ✕ to cancel the test.

With the **"Automatic" start mode**
Perform the zeroing if necessary by pressing the key 0/T

Load the sample tray on the weighing star-shaped item and switch off the heater.

With the **“Manual” start mode**
Perform the zeroing if necessary by pressing the key Ø/T.
Load the sample tray on the weighing star-shaped item and switch off the heater. Then press the key ↵ to confirm.

After resetting the sample tray, load the substance to be analyzed on the tray.



With the **“Automatic” start mode**
Perform the zeroing if necessary by pressing the key Ø/T.
Load the substance to be analyzed on the sample tray and switch off the heater.

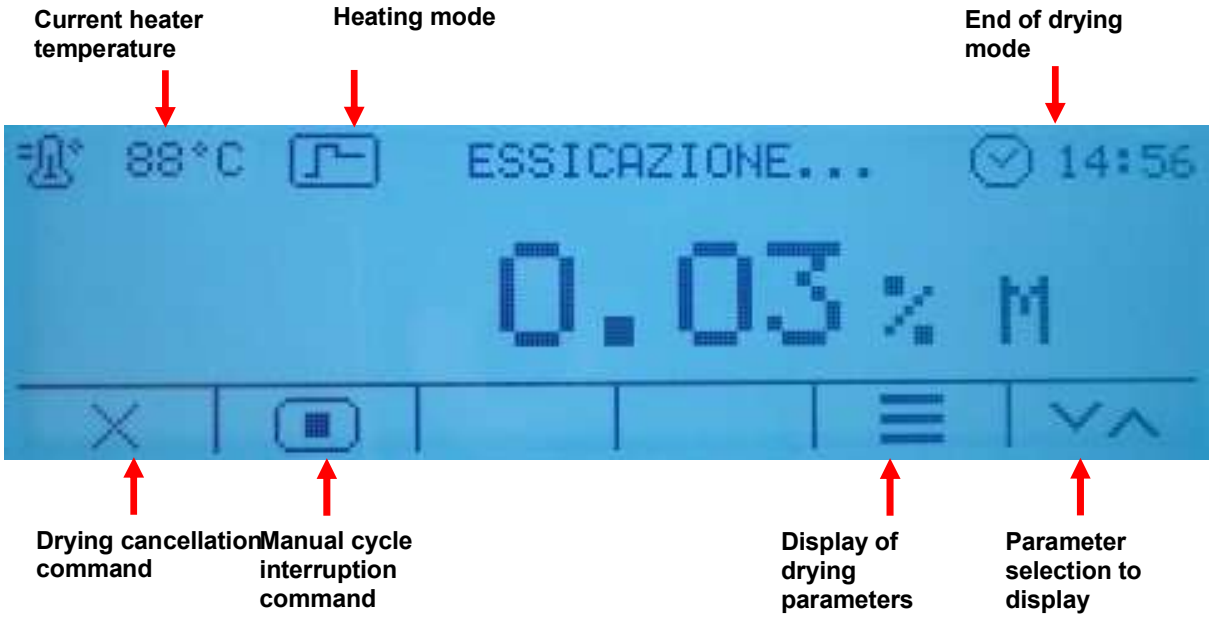
With the **“Manual” start mode**
Perform the zeroing if necessary by pressing the key Ø/T.
Load the substance to be analyzed on the sample tray and switch off the heater. Then press the key ↵ to confirm.

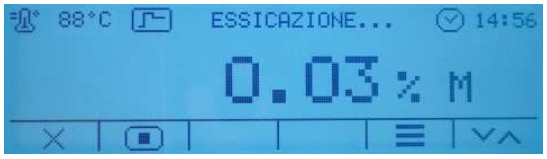
N.B. The minimum weight of substance allowed for the drying cycle varies according to the scale resolution:
Resolution 0.01g => Min 500mg
Resolution 0.001g => Min 500mg
Resolution 0.0001g => Min 50mg

After closing the heater, the analysis cycle will be started.

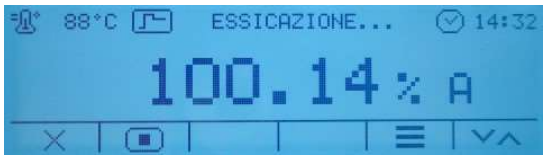
7.4 Features available during and at the end of the drying cycle.

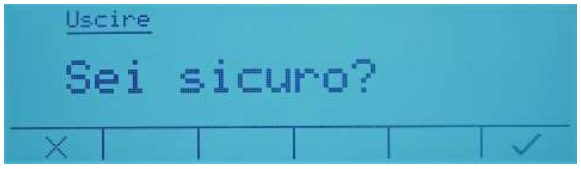
Below are all the functions available during and at the end of the drying cycle, valid for both "Simple" and "Advanced" modes.

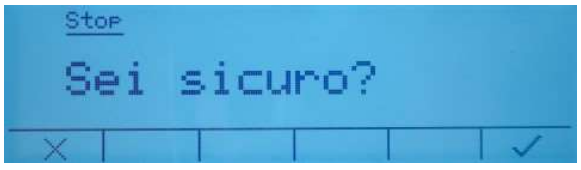




.....







Selection of the parameter to be displayed. By pressing the key  , you can rotate the display of the following drying parameters:

- **% M** Humidity
- **% R** Dry residue
- **% A** Other (Ratio between initial weight and final weight expressed in %)
- **G** Weight

Abort: by pressing the key  ,the drying cycle will be canceled and you will return to the "start" screen.
To cancel the analysis, confirm by pressing the key 

Stop: by pressing the key  , the drying will be interrupted and the "End" screen will be displayed.

To stop the analysis, confirm the selection by pressing the key 

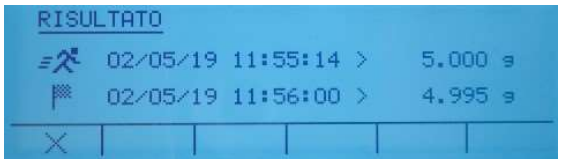
Parameters: by pressing the key , you can display the parameters used for the drying cycle.

Press the key to return to the drying screen.

At the end of drying a short beep will be heard and the **"Result"** drying screen will be displayed.

On this screen you can perform the following operations:

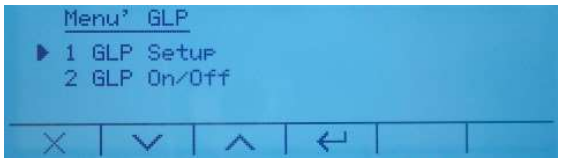
1. Change the display of the drying parameter by pressing the key .

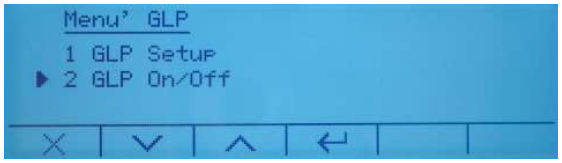


2. Display the drying result by pressing the key

Indications relating to the time and amount of substance at the beginning of the analysis.

Indications relating to the time and amount of substance at the end of the analysis.





3. Set the GLPs for printing by pressing the key GLP, so you can modify and enable/disable the GLP information for printing.

Use the arrows to switch from one menu to another.

Then confirm the selection with the key

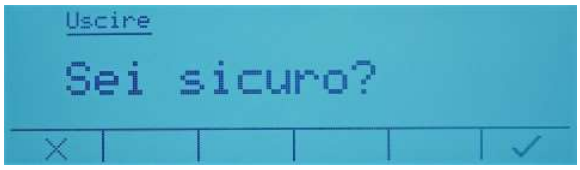
```
------------------------------
12/06/19  10:40:47 AM
------------------------------
Scale ID:
xxxx
------------------------------
User ID:
yyyy
------------------------------
Project ID:
zzzz
------------------------------
Standard          100°C
Time               15 Min
------------------------------
12/06/19  10:46:02
Initial W.        1,345g
------------------------------
12/06/19  11:01:02
Final W.          1,345g
------------------------------
Humidity       0.00 % M

Signature:

------------------------------
```

4. Print the test result, by pressing the key  so you can decide what to print of the test result.

The print values and mode depend on the settings made in the peripheral settings.



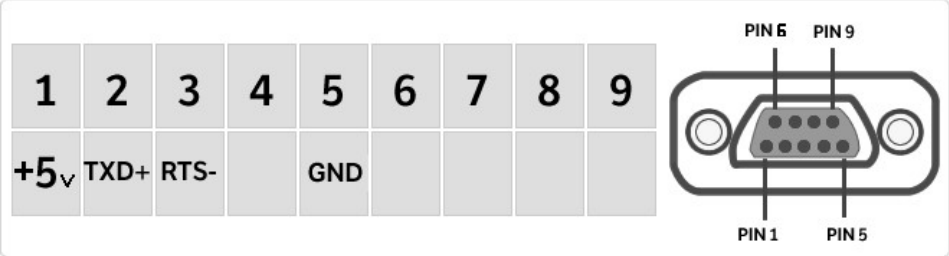
5. Leave the test result and return to the weighing screen by pressing the key  .

To exit the results screen and return to the weighing screen, confirm the selection by pressing the key  .

8 Serial interface connections

The instrument is equipped with as standard with RS 232C interface for connection with a serial printer.
To guarantee communication between the instrument itself and the printer, the following conditions must be satisfied:

- connect the printer using a suitable cable matching the position of the printer signals with those of the instrument.
- According to the printer parameters, set correctly the transmission speed and the type of printer. See chapter "Peripheral settings"



9 Technical features

The models to which this manual refers are all intended for internal use.
Maximum height of use: 4000m
Degree of pollution: 2
Overvoltage category: II

Power supply:	**INPUT: 220-240Vac (110V at request) 50Hz**
Power consumption:	**430 VA**
Dryer range of temperature:	**+35 –160 °C at 1°C steps**
Lamp type:	**Halogen 400W**
Interface:	**N°1 RS232**
Working temperature:	**+5°C - +35°C**
Air humidity:	**45% - 70% not condensing.**

10 Tips for the determination of the humidity content of the substances

10.1 Preparing the sample

Prepare a sample only at a time to prevent humidity exchange with the environment.
If you want to prepare multiple samples simultaneously, make sure to store them in a tightly closed container to prevent changes during storage.
For repeatable results, the sample should be distributed on the test plate in a homogeneous and evenly manner with a thin layer.
If the distribution is not homogeneous even the heat will not be uniform on the substance thus determining a drying that is not complete and longest drying time.
A substance accumulation causes a greater heating of the surface layer with the consequent formation of a burned layer. The considerable thickness of the burnt layer prevents the removal of humidity in the lower part of the sample. The humidity that remains trapped in the substance leads to incorrect results that are not less repeatable.

Preparing the samples of solid substances

Arrange evenly on the sample pan powdered substances or granules.
If the samples are large seeds, chop them with special instruments.
During this process, avoid overheating the substance.

Preparing the samples of liquid substances

In the case of liquids or samples subjected to fusion, we recommend using glass fabric filters involving the following advantages:

- uniform arrangement by capillary action,
- no dripping,
- fast evaporation due to increased surface area.

10.2 Types of samples

A good rule for the humidity determination occurs on samples that have the following properties:

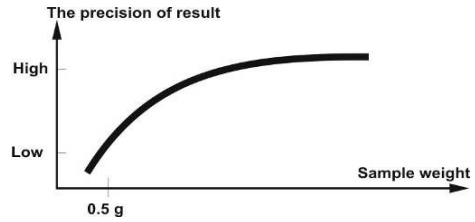
- Solid material in powder form or grains,
- Thermally stable materials that evaporate easily, volatile substances without addition of particular substances,
- Evaporating liquids up to become dry matter without formation of film.

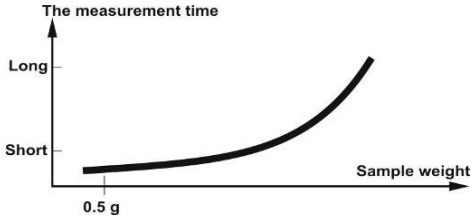
The humidity determination could be critical in the case of samples that:

- are sticky and viscous,
- during heating easily undergo chemical decomposition or release various components,
- have tendency to create surface film when subjected to heating.

10.3 Amount of substance and duration of the drying cycle.

The composition of the substance affects significantly the duration and the accuracy of the humidity measurement results.
A small amount of the substance will result in a faster drying cycle, but with less precise results.
While a greater amount of the substance will need higher drying times but with more reliable and repeatable results.





Therefore, based on the substance, it's necessary to determine the right compromise between the drying time and the accuracy of the results you want to obtain.

11 Care and Maintenance

Periodic maintenance of your balance guarantees the safety of your measuring tool.

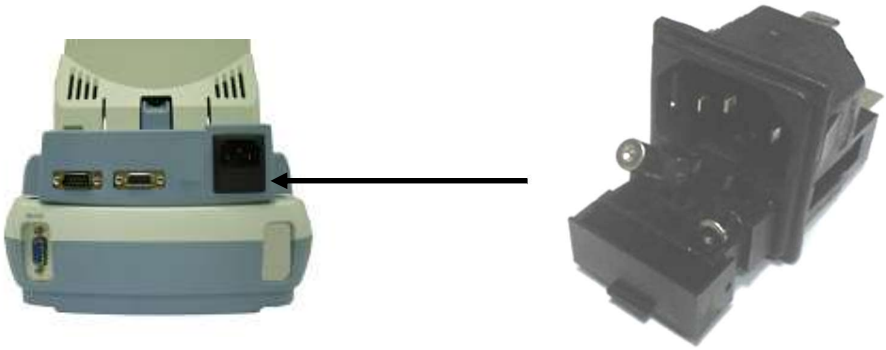
- **Cleaning**
  Before cleaning the balance, unplug the power supply unit from the wall socket.
  Do not use harsh products (solvents or similar agents), but a damp cloth with a mild detergent. Prevent the penetration of liquids into the device during cleaning; after cleaning, dry with soft cloth. Remains of sample and dust can be removed with the use of a brush or vacuum cleaner.
- **Safety checks**
  The safety of the device is no longer ensured when:
  -The power supply unit is visibly damaged
  -The power supply unit no longer works
  -The power supply unit has been stored for a long time in unfavorable conditions.
  In these cases, please contact the service center where technicians will perform any repairs to restore the device in a safe condition.

12 Troubleshooting

Problem	Possible cause
The device does not switch on	▪ VDE cable not connected. ▪ Cable connecting the balance and the heater not inserted. ▪ Fuses damaged (see **Section 13** for any replacement).
The measurement lasts too long.	▪ Switching off criterion set in a bad way.
The measurement cannot be repeated.	▪ Sample is not homogenous. ▪ Drying time is too short. ▪ Too high drying temperature (i.e. oxygenation of the sample material, exceeded the boiling temperature of the sample). ▪ Temperature sensor dirty or broken.
The weight value changes continuously.	▪ Draught. ▪ Table/support surface vibration. ▪ Electromagnetic fields/static charging (choose another place of positioning of the balance/if possible, turn off the system causing the problems).

13 Replacing electrical fuses

The VDE socket placed on the back of the device is equipped with a pan containing the electrical protection fuses.
The fuse model to be used is the following:
UTE T 2A 250V 5x25
The replacement must be performed by qualified personnel and with no current.
Remove the VDE cable from the device.
Open the fuse-holder box.
Remove the faulty fuses and insert new ones.
Close the fuse-holder box.



14 Error Codes

ERROR MESSAGE ON DISPLAY	MEANING	POSSIBLE SOLUTIONS
ERR01	Weight not stable after operation of tare	Protect the balance from air flows or from vibrations of the working table
ERR02	impossible to start the calibration due to instability of the balance	Protect the balance from air flows or from vibrations of the working table.
ERR03	calibration weight not correct or balance unstable	Calibrate with correct weight or protect the balance from environment disturbs

15 Storage conditions

- **Storage temperature** +5 °C…+40°C
- **Storage humidity** 45% - 75%.
- **Keep the packaging of the balance** in the event of possible deployment for customer service; unplug all cables and any accessories to prevent unnecessary damage.
- **Do not expose** the balance unnecessarily to extreme temperatures and humidity, and avoid violent shocks.

16 Technical service

Web Resources

Visit the VWR's website at **www.vwr.com** for:
• Complete technical service contact information
• Access to VWR's Online Catalogue, and information about accessories and related products
• Additional product information and special offers
Contact us For information or technical assistance contact your local VWR representative or visit. **www.vwr.com**.

17 Warranty

VWR International warrants that this product will be free from defects in material and workmanship for a period of two (2) years from date of delivery. If a defect is present, VWR will, at its option and cost, repair, replace, or refund the purchase price of this product to the customer, provided it is returned during the warranty period. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or from ordinary wear and tear. If the required maintenance and inspection services are not performed according to the manuals and any local regulations, such warranty turns invalid, except to the extent, the defect of the product is not due to such non-performance.

Items being returned must be insured by the customer against possible damage or loss. This warranty shall be limited to the aforementioned remedies. IT IS EXPRESSLY AGREED THAT THIS WARRANTY WILL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND IN LIEU OF THE WARRANTY OF MERCHANTABILITY.

18 Compliance with local laws and regulations

The customer is responsible for applying for and obtaining the necessary regulatory approvals or other authorizations necessary to run or use the Product in its local environment. VWR will not be held liable for any related omission or for not obtaining the required approval or authorization, unless any refusal is due to a defect of the product.

19 Equipment Disposal

This equipment is marked with the crossed out wheeled bin symbol to indicate that this equipment must not be disposed of with unsorted waste.
Instead it's your responsibility to correctly dispose of your equipment at lifecycle -end by handling it over to an authorized facility for separate collection and recycling. It's also your responsibility to decontaminate the equipment in case of biological, chemical and/or radiological contamination, so as to protect from health hazards the persons involved in the disposal and recycling of the equipment.
For more information about where you can drop off your waste of equipment, please contact your local dealer from whom you originally purchased this equipment.

By doing so, you will help to conserve natural and environmental resources and you will ensure that your equipment is recycled in a manner that protects human health.

Thank you

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